



GENERAL ASSEMBLY OF THE **EU SPACE** NETWORKS 2026



co-organised by:



The Regional Support Office (RSO) of UNOOSA's programme 'United Nations Platform for Space-Based Information for Disaster Management and Emergency Response (UN-SPIDER) in Cyprus: Challenges and opportunities

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Eratosthenes Centre of Excellence



GOVSATCOM

SSA
Space Situational
Awareness

co-organised by:



United Nations Office for Outer Space Affairs



United Nations
Office for Outer Space Affairs

UNOOSA



Vision: Bringing the benefits of Space to humankind

Mission Statement: Promote international cooperation in the peaceful uses of outer Space to achieve sustainable development goals (Space Law, Space Sustainability, Space4Oceans, Space4Women, etc.)



United Nations Platform for Space-based Information for Disaster Management and Emergency Response



United Nations
Office for Outer Space Affairs

UN-SPIDER

WWW.UN-SPIDER.ORG

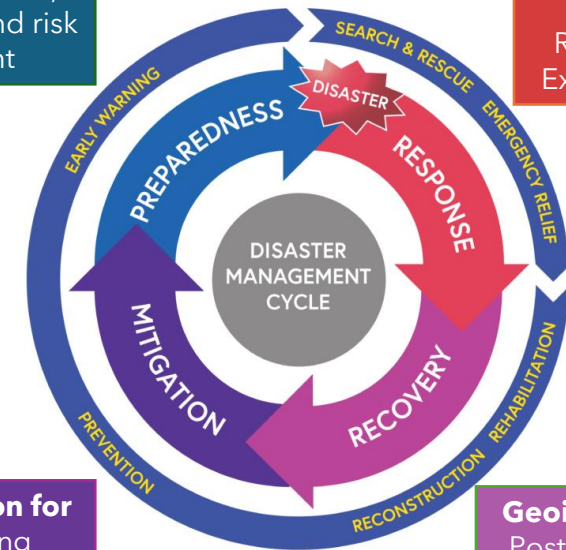
United Nations GA Resolution 61/110, Dec. 2006

Ensure that all countries have access to and develop the capacity to use all types of Space-based (Geo)information (EO data, GNSS, SatComms) to support the full disaster management cycle

**Offices in Vienna, Beijing and Bonn,
Latin America (upcoming)**

Geoinformation for
Hazard, exposure,
vulnerability, and risk
assessment

**Geoinformation
for**
Rapid mapping:
Extent and impact



Geoinformation for
Early Warning
Systems and
forecasting

Geoinformation for
Post Disaster Needs
Assessment / Damage
and Loss Assessment

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United Nations Platform for Space-based Information for Disaster Management and Emergency Response



Technical Advisory Support

UN-SPIDER supports countries in assessing their capacity in the use of Space technologies in all phases of disaster management



Capacity-Building

UN-SPIDER facilitates capacity-building and institutional strengthening – offline and online



Fostering Cooperation

UN-SPIDER fosters alliances and creates fora where the Space and disaster management communities can meet



Knowledge Management

The UN-SPIDER Knowledge Portal is an online hub for discovering, accessing and learning to create space-based information products

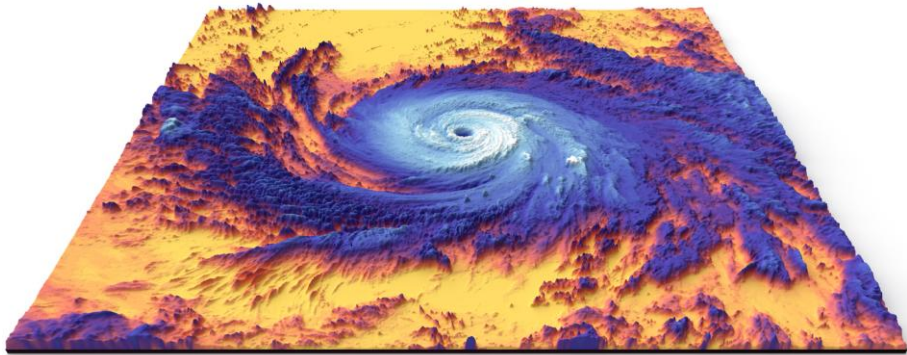




United Nations Platform for Space-based Information for Disaster Management and Emergency Response

UN-SPIDER helps communities benefit from Space solutions for disaster-risk management

- ▶▶ Technical Advisory Mission (TAM)
- ▶▶ Institutional Strengthening Mission (ISM)
- ▶▶ Expert Missions (EM)



Credit: NASA



UNITED NATIONS
Office for Outer Space Affairs

IMPACT

100⁺

capacity-building missions

50⁺

supported countries

40⁺

TAMs delivered

Namibia, Mozambique, Zimbabwe, Zambia, Gabon, Cameroon, Ghana, Nigeria, Togo, Burkina Faso, Tunisia, Sudan, Cap Verde, South Africa, Mozambique, Ethiopia, Sudan, Algeria, Philippines, Armenia, LAO, Nepal, Tonga, Myanmar, Sri Lanka

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United Nations Platform for Space-based Information for Disaster Management and Emergency Response

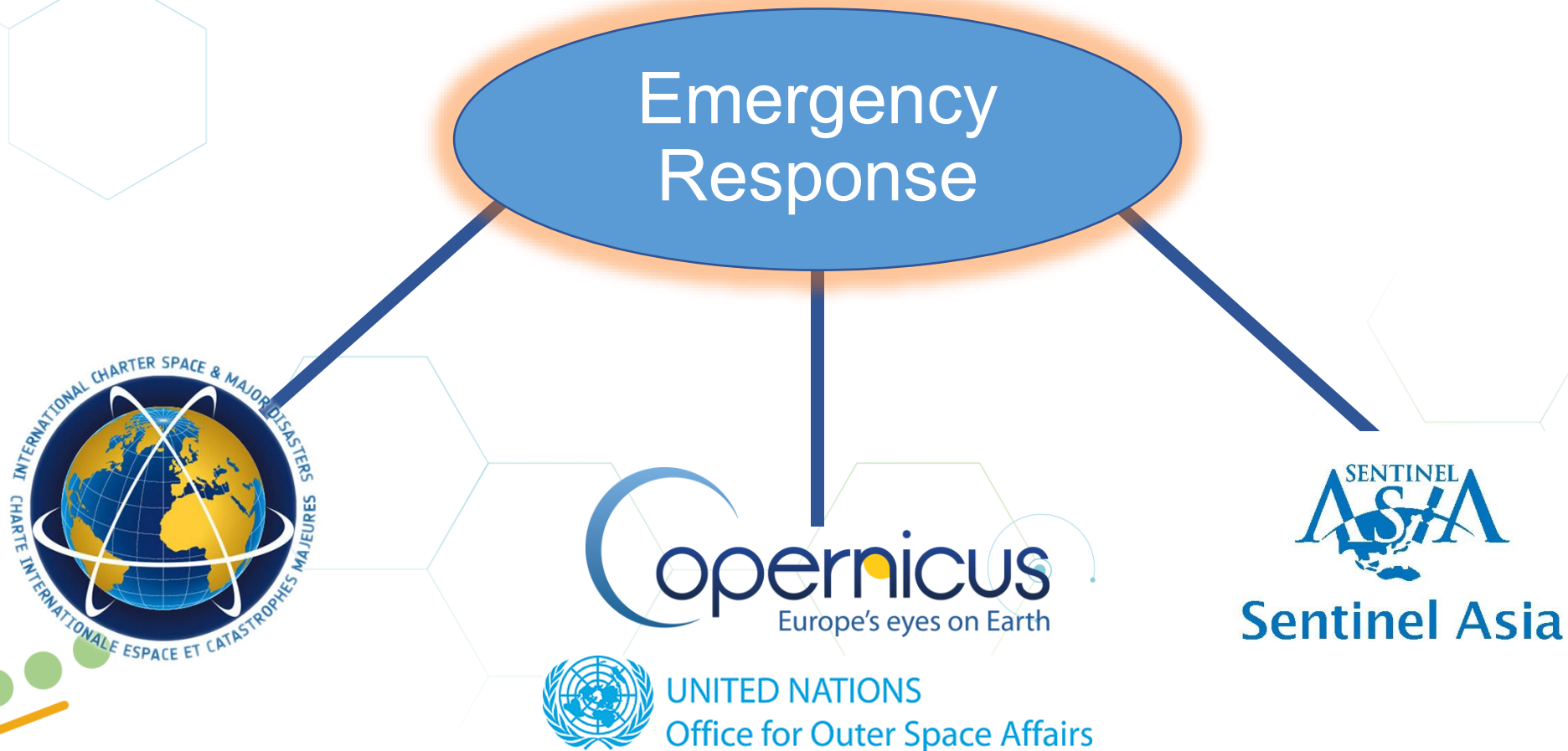
- TAMs provide countries with **tailored recommendations and capacity-building strategies** to integrate Space-based technologies into disaster management, lasting **one week**.
- They assist in crafting strategies, policies, and guidelines that **emphasize the effective use of Earth Observation or other space-based data** throughout all disaster management phases.
- By assessing institutional readiness and gaps, TAMs help countries **design frameworks** that enhance their ability to utilize Space technologies effectively.
- TAMs facilitate **partnerships** among national and international organizations, fostering a deeper understanding of space-based resources and their potential for disaster resilience.





United Nations Platform for Space-based Information for Disaster Management and Emergency Response

Emergency Response Mechanisms

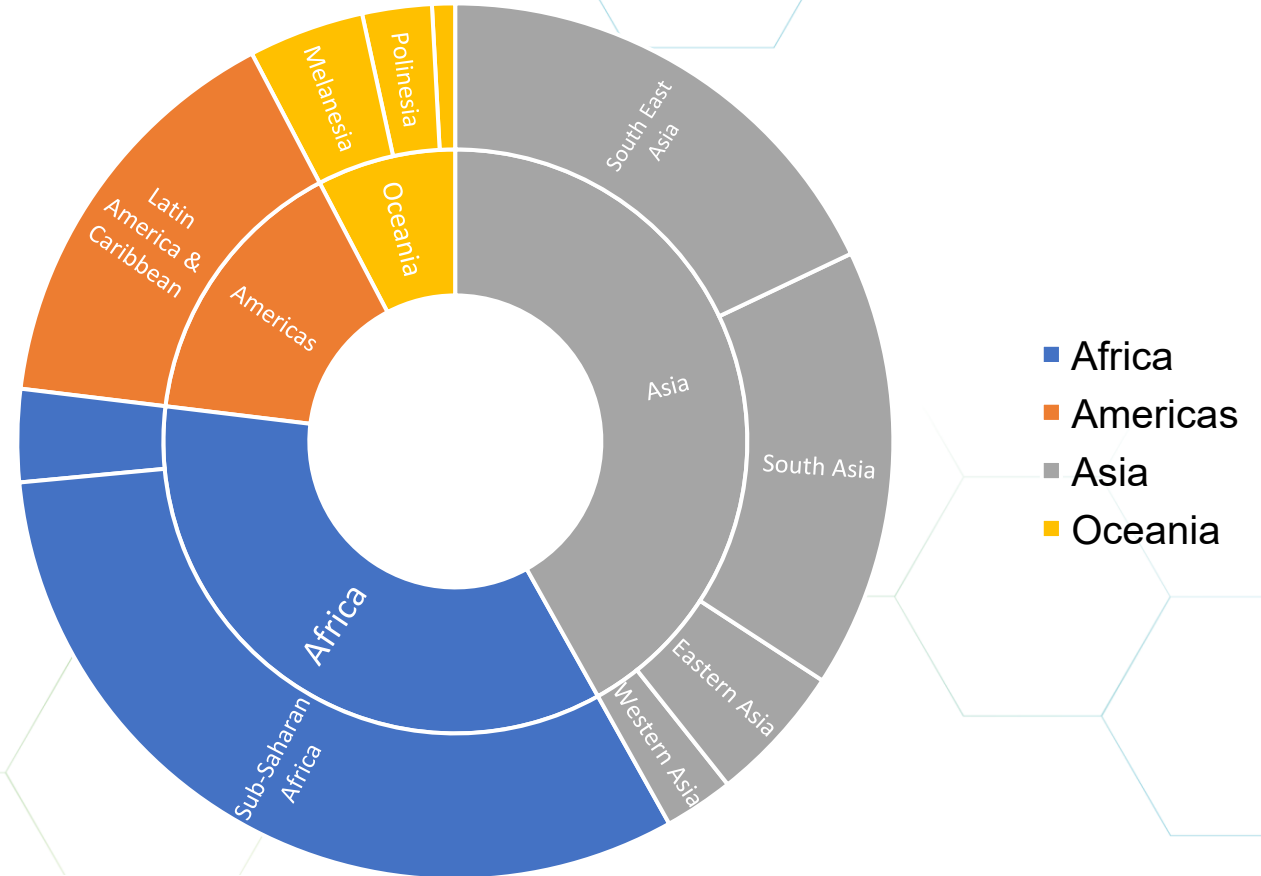


United Nations Platform for Space-based Information for Disaster Management and Emergency Response

The activations addressed disasters of different types affecting around 60 developing countries in Asia, Asia Pacific, Africa, Latin America and the Caribbean.

Activations requested by UNOOSA by region and sub-region

Region	Activations
Africa	37
Americas	18
Asia	49
Oceania	9
Total	113





United Nations Platform for Space-based Information for Disaster Management and Emergency Response

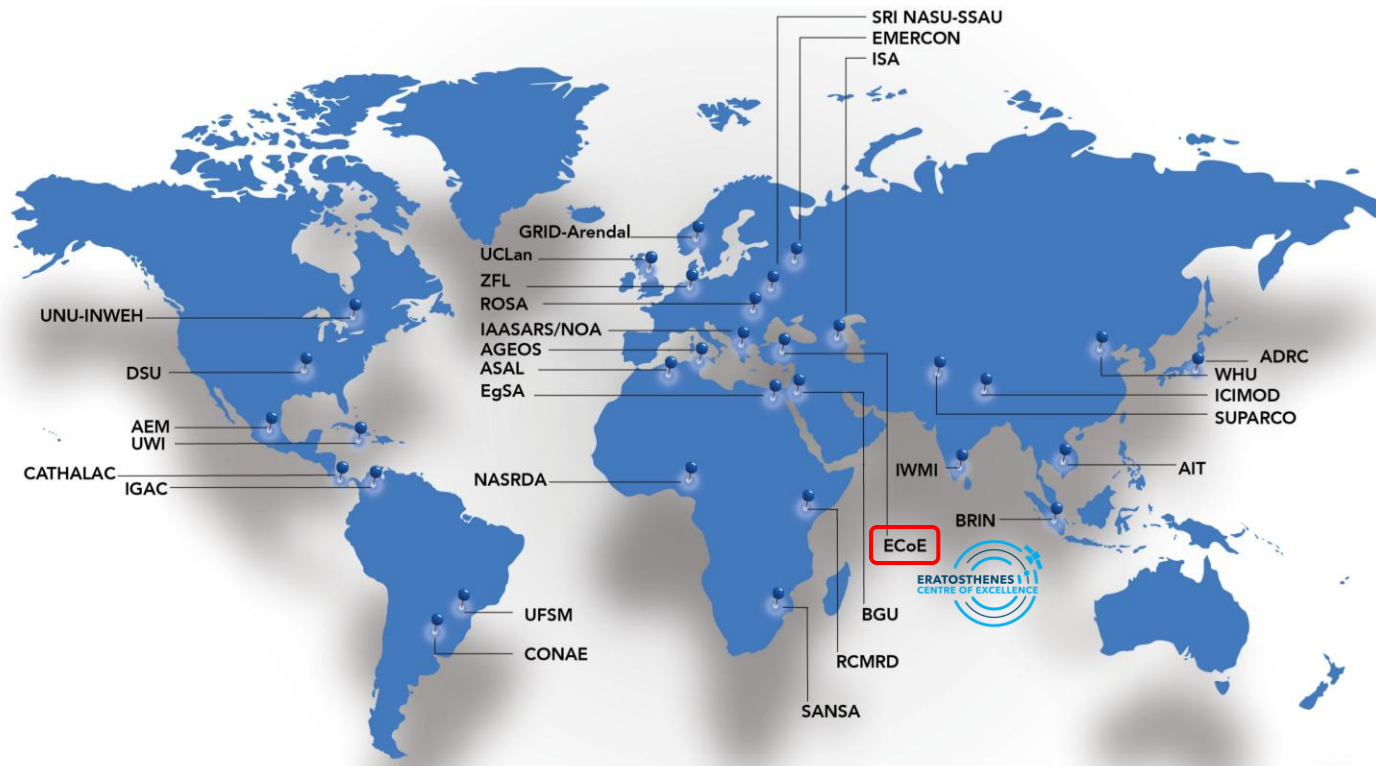


United Nations
Office for Outer Space Affairs

UN-SPIDER

WWW.UN-SPIDER.ORG

31 Regional
Support Offices
worldwide



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The ERATOSTHENES Centre of Excellence as the UN-SPIDER RSO in Cyprus

- Started operating as an UN-SPIDER Regional Support Office in **February 2025**.
- Promote the **use of Space tools for disaster risk reduction** for:
 - Emergency response.
 - Disaster risk reduction and management.
 - Capacity-building on space-based technologies for disaster management.
 - Technical advisory support.
 - Dissemination of methods and results from EO.



The ERATOSTHENES Centre of Excellence as the UN-SPIDER RSO in Cyprus

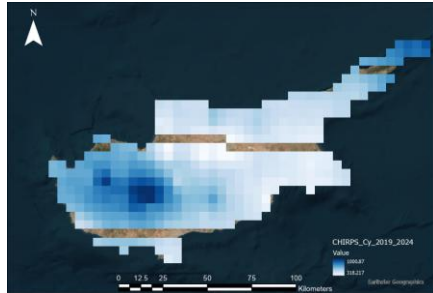
Landslides

AI-based Precipitation Model/Layer

Rain-gauge stations



CHIRPS daily satellite rainfall data (2019-2024)



Random Forest Regressor Model

- The model was trained on 2019–2023 and tested on a fully held-out 2024 year

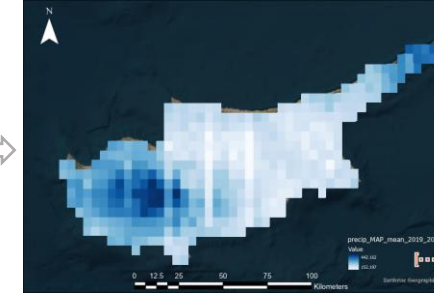
RMSE = -36.9%

MAE = -9%

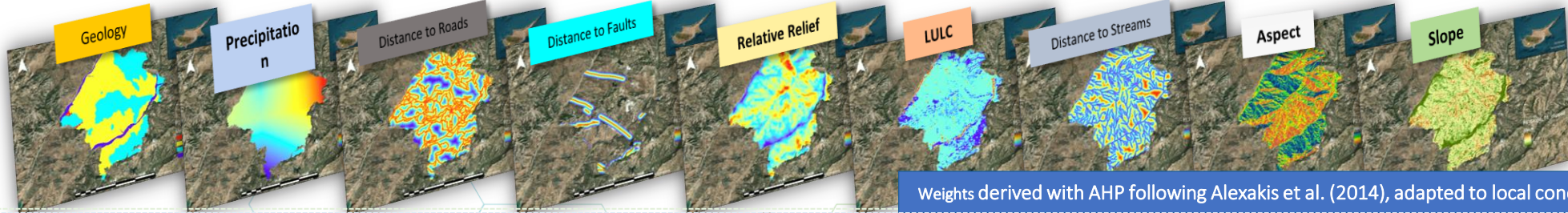
Mean Bias = -22%

$R^2 \approx -0.08$

Mean Annual Precipitation (MAP) → 0-1

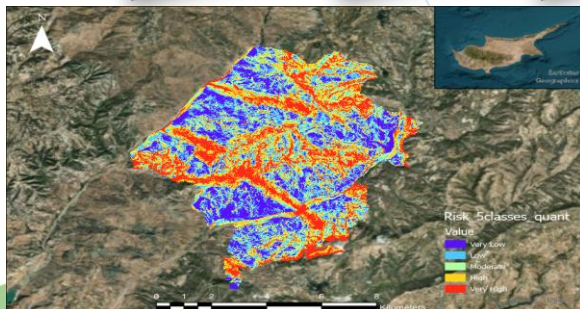


MCDA Analysis

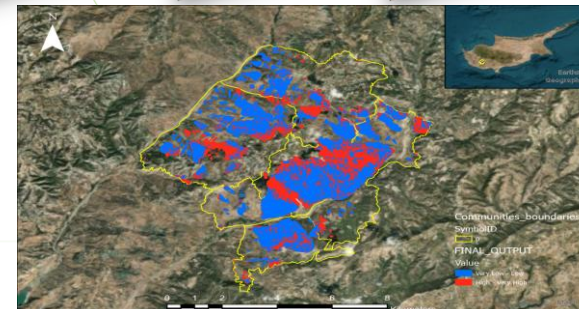


Weights derived with AHP following Alexakis et al. (2014), adapted to local conditions.

Results



Validation of the model against the **2021 landslide inventory** provided by GSD.

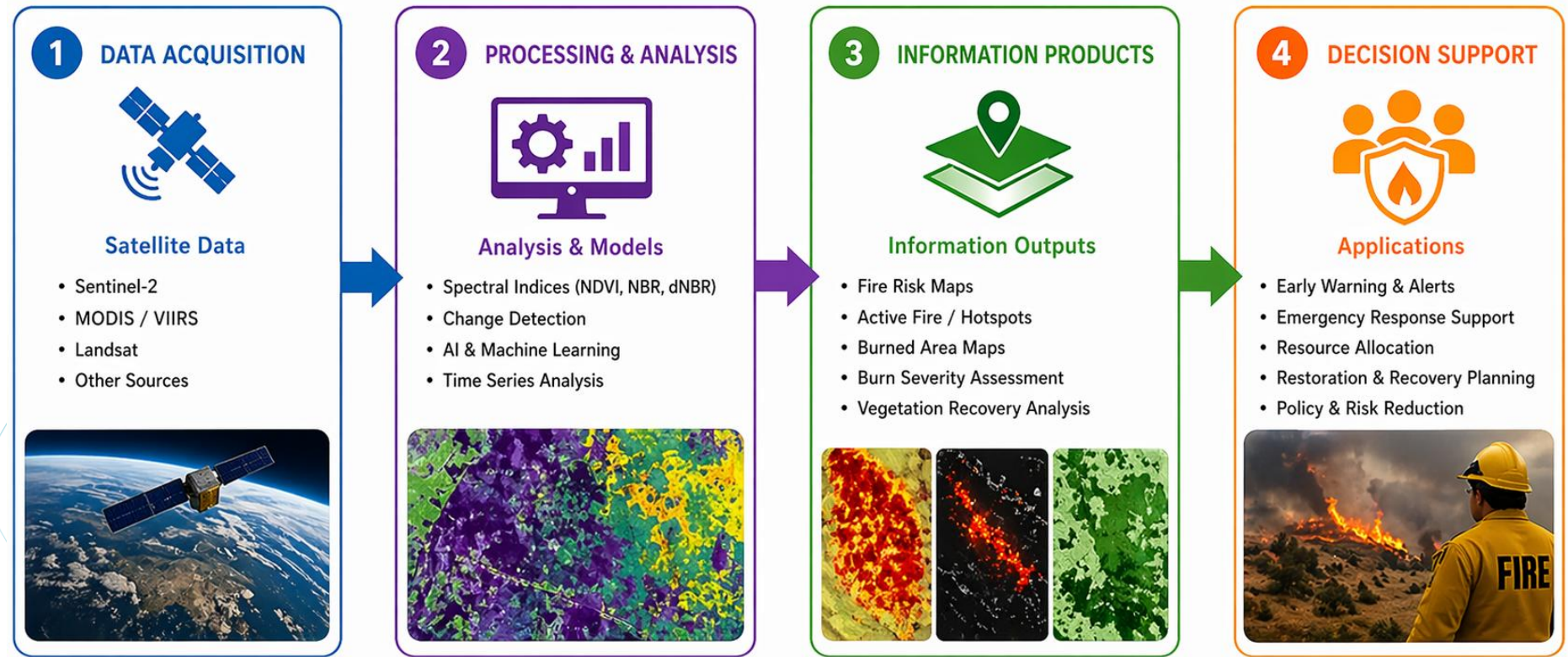


High/Very High classes cover about **40% of the area**, and they capture **33.5% of the known landslides**.

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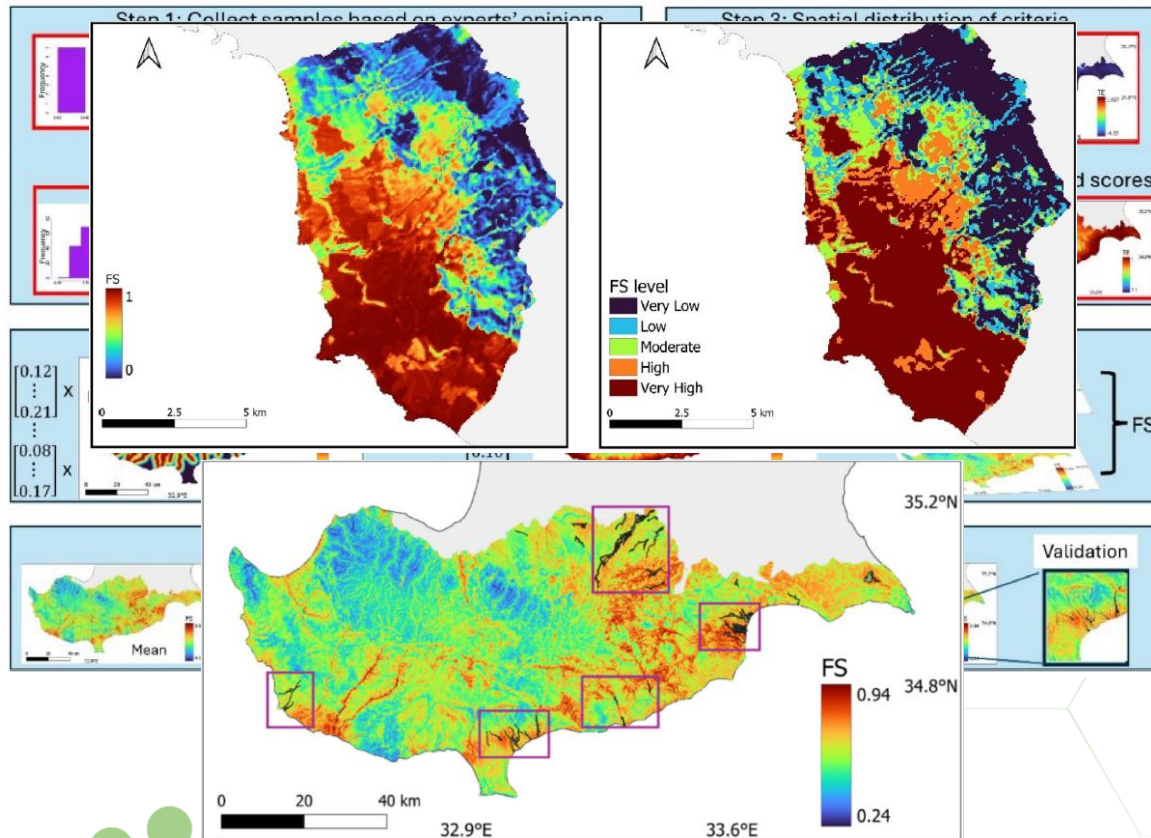
Fires

Turning satellite data
into actionable
information for effective
wildfire management

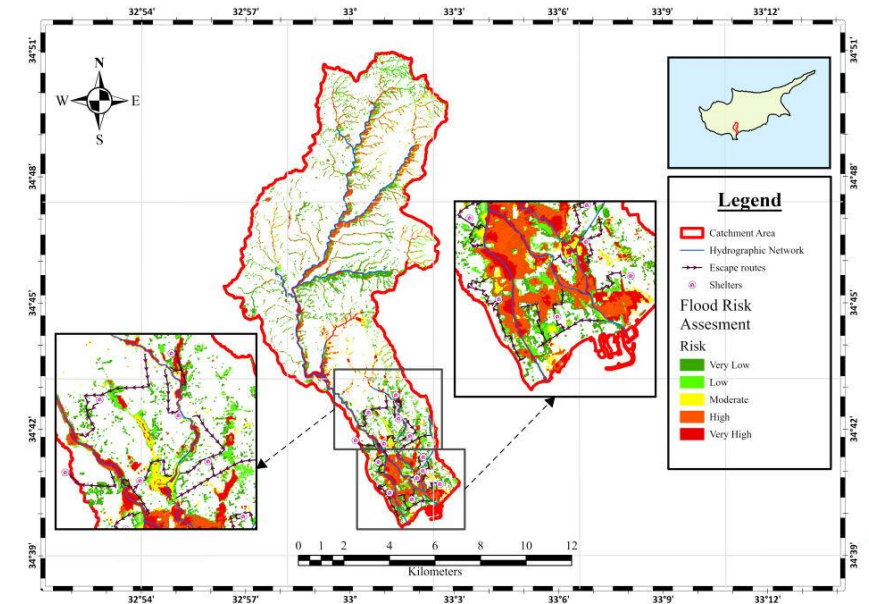


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Floods



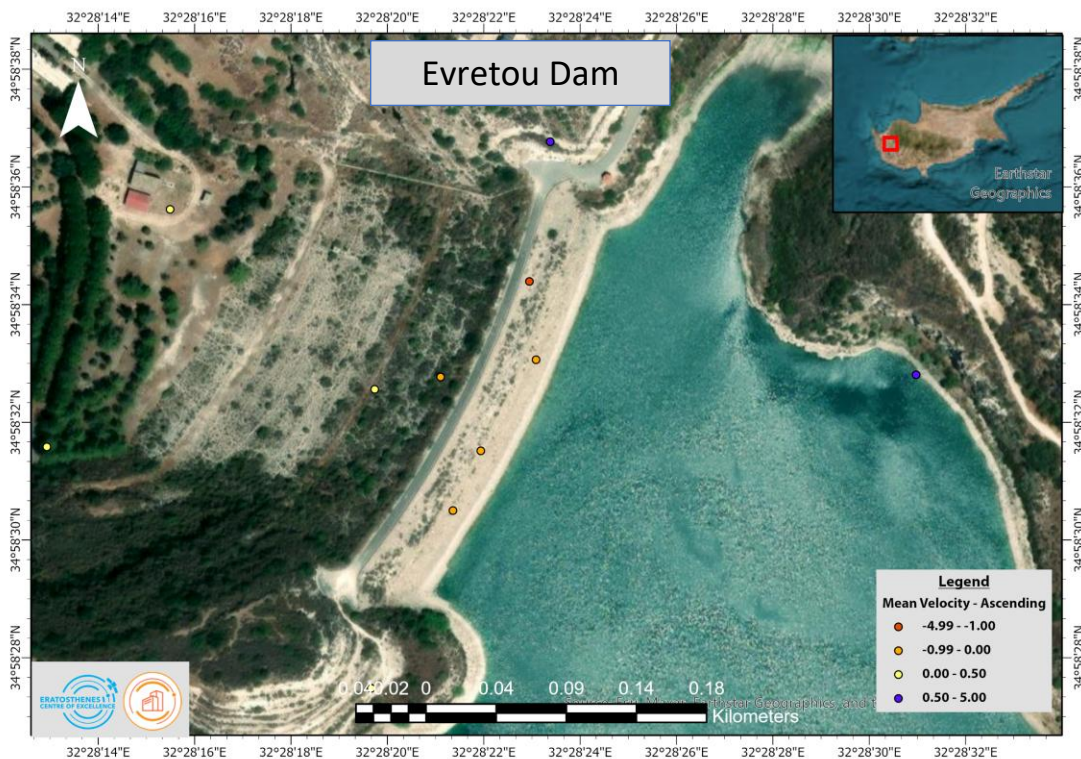
Flood susceptibility



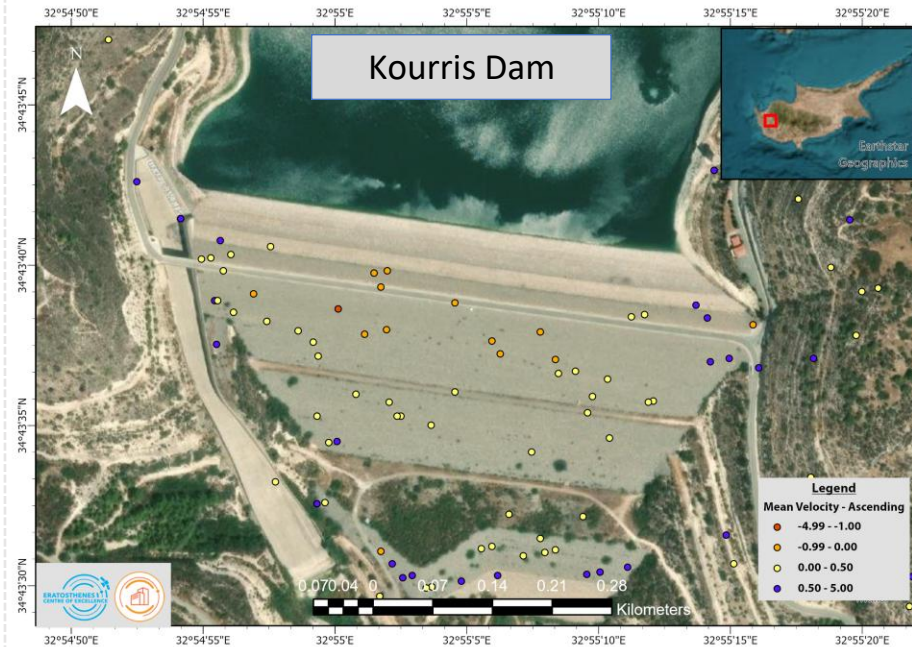
Flood risk map, escape routes and shelters

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Critical infrastructure monitoring

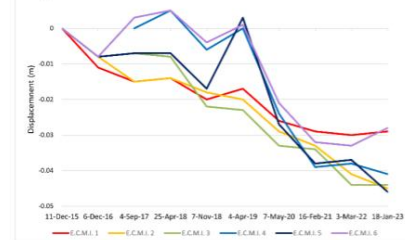


Average LoS Displacements: - 3mm/year

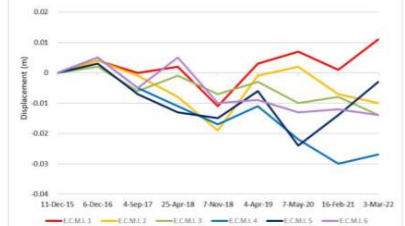


Average LoS Displacements: - 4mm/year

Vertical Displacements
(geodetic measurements) at
crest from 2015-2023



Horizontal Displacement
(geodetic measurements)
located at dam crest from
2015-2023



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NADIRISK: Natural Disaster Risk Assessment tool



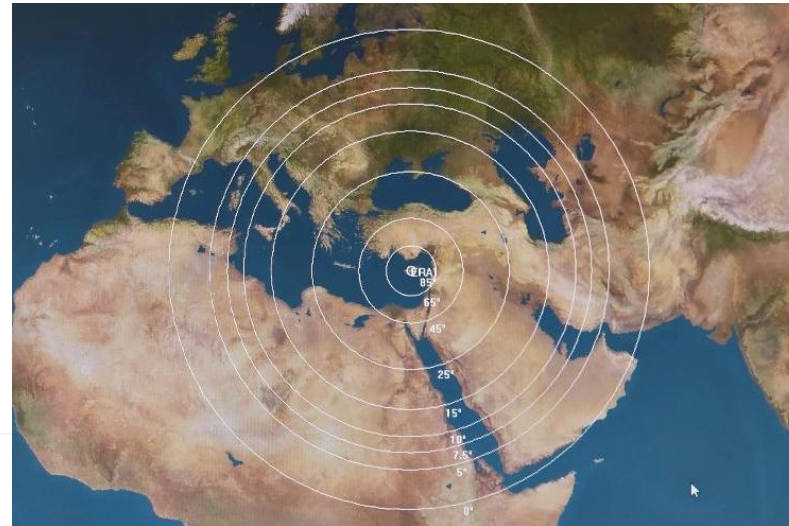
- Provides accurate, actionable disaster risk assessments for earthquakes, landslides, fires, and floods.
- Utilizes satellite imagery and geospatial datasets to produce susceptibility, hazard, vulnerability, and risk maps.
- Offers additional advantages for protecting the Republic of Cyprus from natural and anthropogenic disasters reducing financial losses, improving disaster preparedness, and supporting sustainable urban planning by offering an innovative and user-friendly risk assessment platform.





The ERATOSTHENES Centre of Excellence as the UN-SPIDER RSO in Cyprus

- ERATOSTHENES has established **the first EO DAS in Cyprus**, hosted on one of **CYTA's** fully developed teleports.
- Equipped with a **three-band feed** and capabilities (S, X and Ka) making it suitable to support current as well as future missions.
- Consisting of **state-of-the-art facilities** for acquisition, processing and storage of data.
- Data can be securely transported through Cyta's extensive fiber network, offering **interconnectivity to major Global Hubs**.



The ERATOSTHENES Centre of Excellence as the UN-SPIDER RSO in Cyprus

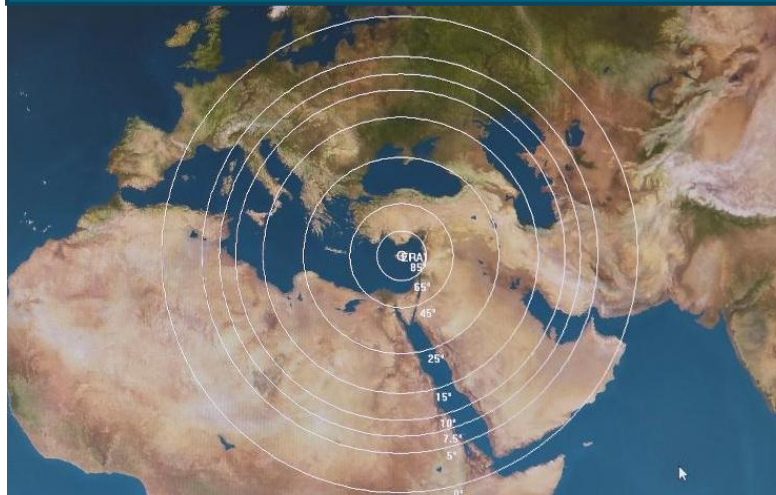
From Disaster Monitoring to Operational Readiness: The Data Acquisition Station (DAS)

Current Limitations

- Delays in satellite data acquisition
- Limited near-real-time capabilities
- Dependency on external data providers
- Low temporal resolution



Solution: DAS



**EO DATA
ACQUISITION
STATION (DAS)**

- Direct reception of EO satellite data
- Near real-time data availability
- Independent data access
- Operational services

Solution: DAS

- Faster data access (near real-time)
- Enhanced early fire detection
- Improved monitoring of fire spread
- Support for AI-based prediction models
- Strengthened decision-making capacity



Challenges

Fragmented governance and coordination complexity

Fragmentation between:

- EU agencies
- UN entities
- National governments
- Military actors
- Civil protection authorities

Security and geopolitical sensitivities

Regional tensions can complicate:

- Data sharing
- Regional cooperation
- Operational transparency

Cybersecurity and Space infrastructure resilience

- Cyberattacks on Space systems
- Satellite signal disruption
- GNSS spoofing/jamming
- Protection of critical infrastructure
- Resilience against hybrid threats

Data access and operational scalability

Difficulties in data access and operational use due to:

- Limited technical expertise
- Insufficient infrastructure
- Lack of trained personnel
- Fragmented national systems.

Balancing civilian and dual-use missions

The EU Space Programme increasingly **combines**:

- Civilian applications
- Security applications
- Defence-related capabilities

This creates **governance questions** regarding:

- Data classification
- Military involvement
- Ethical AI use
- Privacy
- Sovereignty

The ERATOSTHENES CoE as the Cyprus UN-SPIDER Regional Support Office

Navigate:

- Overlapping mandates
- Different operational procedures
- Legal interoperability barriers
- Political sensitivities

Maintain:

- Neutrality
- Trust
- Diplomatic balance
- Secure governance frameworks

Provide strong integration:

- Geospatial intelligence
- Cybersecurity
- Operational risk management

Need sustained investment:

- Regional capacity building
- Cloud processing
- AI tools
- Multilingual operational support

Need clear operational frameworks to preserve:

- Humanitarian principles
- Openness
- International cooperation

Opportunities

Cyprus as a regional geostrategic bridge

Cyprus sits at the **intersection of Europe, the Eastern Mediterranean, the Middle East, and North Africa.**

ERATOSTHENES CoE can become a **regional coordination node:**

- EU institutions
- UNOOSA/UN-SPIDER
- Copernicus Emergency Management Service
- Civil protection agencies
- Neighbouring non-EU countries

Civil protection and disaster resilience leadership

Hotspot for:

- mega-fires
- prolonged drought
- extreme heat
- coastal erosion
- water scarcity

The **Cyprus RSO** can evolve into a **centre of excellence for:**

- Early warning systems
- AI-enhanced Earth Observation
- Predictive disaster analytics
- Climate security intelligence
- Digital twins for resilience planning

Operational coordination and interoperability

Interoperability:

- UN mechanisms
- EU agencies
- national civil protection authorities
- Defence/Security actors
- Research institutions

Operationalize:

- Cross-border data sharing
- Common geospatial standards
- Regional emergency coordination frameworks
- Multinational crisis exercises

Research, innovation, and funding potential

Attract:

- Horizon Europe projects
- ESA partnerships
- EU security research funding
- Dual-use innovation programmes

Stimulate:

- Local high-tech industry,
- AI/geospatial startups
- Satellite analytics services
- Cybersecurity for Space systems
- Digital resilience technologies



- Sentinel satellite images
- Emergency Management Service
- Climate & Security services
- Rapid mapping



- Precise positioning
- Emergency response coordination
- Search and rescue operations
- Resilient navigation infrastructure.



- Secure governmental communications
- Crisis communications resilience
- Emergency coordination in disaster zones.



- Secure satellite communication for civil protection
- Border management
- Maritime security
- Operational continuity during disasters.



The ERATOSTHENES Centre of Excellence as the UN-SPIDER RSO in Cyprus

- ERATOSTHENES CoE is the **Regional Support Office of UN-SPIDER** in Cyprus.
- We **develop end-to-end solutions** for early warning, monitoring, risk and impact assessment for multiple hazards in Cyprus and the EMMENA region utilizing EO data and geospatial information.
- We **provide capacity building** to end-users and decision makers in the Disaster Risk Reduction and Disaster Management domains.
- We have **invested in critical infrastructure** and can **provide data** to stakeholders from the Public sector and Industry to assist them in taking informed decisions.





Thank you!!!

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